

eyases that were fostered into wild nests from domestic sources of falcons. The combined fledging success was 2.6 y/attempt and 2.96 y/successful pair. Adult survivorship, nest-site and mate fidelity, and genetic relationships were monitored by positive determination of identities of adults and DNA fingerprinting. Plans for release by hacking at several sites were preempted by territorial juvenile or adult pairs. Given the productivity and stability of this restored population, it is likely that hacking of falcons will occur at a greatly diminished level in 1993 and cease altogether thereafter.

MANAGEMENT RECOMMENDATIONS FOR THE NORTHERN GOSHAWK IN THE SOUTHWESTERN UNITED STATES

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Recommendations for managing goshawk habitat in three forest cover types (ponderosa pine, mixed conifer, and spruce-fir) are described in detail. The recommendations were developed based upon the known habitat requirements of goshawks and 14 important prey species. Although the management strategy is focused on forests in the southwestern United States, these multi-species management recommendations have the related benefit of being applied across the western landscape, not just within goshawk territories. A strength of the management approach is the recommended return to pre-settlement-like forest conditions. This entails a gentler management approach that retains large areas of mid-aged (80–120 years) to old forests (200+ years) across the landscape.

DISTRIBUTION AND HABITAT CHARACTERISTICS OF MEXICAN SPOTTED OWLS IN ZION NATIONAL PARK, UTAH

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Distribution, habitat characteristics, and food habits of the Mexican spotted owl (*Strix occidentalis lucida*) were investigated in Zion National Park. Two hundred and twenty-nine surveys were conducted in canyon and plateau habitat between May–August 1989 and April–August 1990. I located owls in nine different locations; each owl was associated with narrow canyons, “hanging” canyons, and cliff sites. The minimum estimated density in Zion

National Park was 0.02 owls/km² in 1989 and 0.03/km² in 1990. Spotted owls were widely distributed and coincident with discontinuous habitat within the park. I used stepwise discriminant analysis to examine the habitat differences between 1) observed owl microsites and available microsites and 2) observed owl canyon habitat and available canyon habitat. Spotted owl microsites had higher humidity, more vegetation strata, narrower canyon widths, and higher percentage of ground litter than available microsites. Habitat within owl use canyons had higher humidity and higher total snag basal area than available canyon habitats. Owls may be selecting canyon habitat not only for the structural habitat features but also for the microclimate. The presence of canyons and cliffs may provide necessary refuges from high daytime temperatures that occurred in the study area. Mexican spotted owls do not appear to depend on extensive stands of old-growth forests as do northern spotted owls (*S. occidentalis caurina*) because this type of habitat is lacking in Zion Park. Seventy-one prey items were identified from 60 pellets collected from two owl territories. Mammals comprised 99.9% of estimated biomass and 80.3% of the total diet composition. Bushy-tailed woodrats (*Neotoma cinerea*) were the primary prey taken by owls. They comprised 67.3% of the estimated biomass and 40.3% by frequency of the diet. Further studies are needed to investigate the habitat requirements of the spotted owl in the northern region of its range.

RESPONSE OF GREAT HORNED OWLS TO MANIPULATIONS OF PREY DENSITIES IN THE BOREAL FOREST

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Foraging theory and models of territoriality predict that an animal will travel less when food is abundant and that its home range size will decrease. This concept is often applied to interpret movement and home range data in wildlife biology, although little experimental evidence exists for larger animals. A collaborative project near Kluane Lake in the southwestern Yukon was designed to investigate the interactions of animal populations of different trophic levels in the boreal forest ecosystem. Experimental food additions to snowshoe hares and ground squirrels resulted in up to 20 times higher densities on areas of 0.5–1 km². Two owls on territories with increased prey levels were chosen as experimental birds and radiotelemetry was used to compare them to 4 controls. Despite the extreme contrast in prey base, no differences in movement rates and home range sizes were apparent. This suggests caution for the general use of these measures as standard management tools. Can the sampling be refined, or does the concept not apply to our organisms? This question is open at the moment. One explanation is that the predictions from theory have been derived for an animal that searches randomly through homogeneous habitat. Great horned owls